# ROLE OF FNAC CORRELATION WITH HISTOPATHOLOGY IN HEAD AND NECK LESIONS

ADissertation

Submitted to the
Tamil Nadu Dr.M.G.R.Medical University
in partial fulfillment of the requirements for the degree of

**DOCTOR OF MEDICINE IN PATHOLOGY**

M.D. (PATHOLOGY)
Branch - III

**DEPARTMENT OF PATHOLOGY,**
**KILPAUK MEDICAL COLLEGE & HOSPITAL,**
**CHENNAI - 600 010.**

**MARCH - 2007**

# CERTIFICATE

This is to certify that this dissertation on **"ROLE OF FNAC WITH HISTOPATHOLOGY IN HEAD AND NECK LESIONS"** is a work done by **Dr.C.P.LUCK,** under my guidance during the period 2004 - 2006. This has been submitted in partial fulfillment of the award of M.D. Degree in Pathology (Branch - III) by the Tamil Nadu Dr.M.G.R. Medical University, Chennai.

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# ACKNOWLEDGEMENT

It is my pleasure and privilege to record my deep sense of gratitude to **Dr.EZHIL VIZHI ALAVANDAR, M.D., Ph.D.,** Professor and HOD, Department of Pathology, Kilpauk Medical College for her constant encouragement, motivation and guidance given to me in compiling this Dissertation. Without her meticulous approach into every detail, my task would have been much more difficult.

I wish to express my deep sense of gratitude to **Dr.VASANTHY, M.D.,** Professor, Department of Pathology, Government Kilpauk Medical College whose sustained support has been invaluable to me.

I wish to express my deep sense of gratitude to **Dr.S.MARY LILLY, M.D.,** Professor, Department of Oncopathology, Government Royapettah Hospital, whose sustained support has been invaluable to me.

I wish to thank **Dr.VIJAYALAKSHMI, M.D.,** Professor, Department of Pathology, Government Royapettah Hospital for helping me in my endeavour.

I wish to express my deep sense of gratitude to all my **Assistant Professors and Tutors** for their help and guidance rendered to me during the period of study.

My utmost thanks and special gratitude is due to all my fellow Post graduates and Technical Staff for their constructive support.

I thank my husband for constant moral support and providing me confidence to complete the study.

# CONTENTS

# INTRODUCTION

**Fine Needle Aspiration Cytology** as practiced to-day, is still a relatively new discipline and no single pathologist can lay claim to the vast experience of its every facet. The numerous case reports of all kinds of rare and exotic tumours and other pathological processes diagnosed by fine needle aspiration cytology (FNAC) published in the cytology journals create the impression that nothing is impossible for this technique.

As fine needle aspiration procedure being cost - effective, simple office procedure, quick diagnosis at the first contact of patient and it can delineate between benign and malignancy and can be repeated for definite confirmation on doubtful diagnosis.

We have taken up lesions of Head and Neck fine needle aspiration cytology in comparison with histological correlation for available lesions like thyroid, lymphnode, salivary glands and soft tissue tumours. Head and neck masses are common and the lesions are varied, ranging from inflammation to neoplasms. Fine needle aspiration cytology helps us to catagorise the lesions which require surgical intervention and those which do not.

FNB is of great assistance in the management of patients, since therapeutic decisions can be made earlier and without the need for further diagnostic surgery. The diagnostic accuracy of FNAC in suspected and recurrent and metastatic tumours is generally high. Small nodal metastasis can be missed. By far the most common indication for FNB in the head and neck is the investigation of suspected local recurrence or nodal metastasis of previously diagnosed and treated cancer[18].

FNAC being a minimally invasive technique is particularly suitable in this sensitive area where an incisional biopsy may present problems. A preoperative cytological diagnosis of a primary neoplasm may allow more rational planning of surgery. The anaplastic and

poorly differentiated lesions can be planned for palliative radiotherapy or chemotherapy.

Fine needle aspiration cytology of the thyroid gland is firmly established as a first line of diagnostic test for the evaluation of pre operative diagnosis of thyroid lesions with the combination of necessary laboratory tests[20]. The present study was undertaken to evaluate the accuracy of FNAC in diagnosing both benign and malignant lesions and also to correlate the cytologic diagnosis with histopathological findings.

Lymphadenopathy is a sign of inflammation, infection, primary or metastatic malignant tumours. This is commonly seen involving the head and neck region. Their persistence for a prolonged period of time, requires further investigation. In recent years aspiration has become popular for the diagnosis and typing of "Lymphoma"[23].

The salivary glands are eminently accessible to FNB and material is easily obtained. The variety of lesions having diagnostic dilemma in salivary neoplasms are not uncommon. Problems of pitfalls in FNAC diagnosis of salivary gland lesions have attracted considerable interest in recent years..

The purpose of FNAC is not a substitute for histology and if it is used in conjunction with clinical and radiological parameters it will provide the best initial assessment on which management decisions can be based. It is true that the increasing use of ancillary techniques such as, immunohistochemistry, electron microscopy, cytogenetics and molecular biology techniques has significantly enhanced the potential to make precise type specific diagnosis but they are expensive and not done as a routine, can be applied in problem cases. Representativeness, adequacy and quality of preparation will always remain "sine qua non" no matter how sophisticated the supplementary techniques[18].

# AIM OF THE STUDY

FNAC being minimally a invasive technique is particularly suitable for Head and Neck lesions where an incisional biopsy may present problems. In the experienced hands FNAC is highly reliable and can be used for definitive treatment without the need for further confirmatory tests.

The aim of the present study is to evaluate our institutional experience of the accuracy of FNAC diagnosing non neoplastic and neoplastic lesions and also to correlate the FNAC diagnosis with histopathological findings.

# REVIEW OF LIERATURE

Fine needle aspiration cytology diagnosis has important application in clinical practice. It is the most useful component of clinical tissue cytology.

The most important era of cytopathology began in 1941 with the publication by Drs.George N. Papanicolau, an anatomist, and Herbert F.Traut, a gyanecologist, of an article in the American Journal of Obstetrics and Gynaecology, "The diagnostic value of vaginal smears in carcinoma of the uterus". Drs.Papanicolau and Traut were members of the faculty of cornell university Medical school in New York City. There article was followed in 1943 by their famous monograph diagnosis of uterine cancer by the vaginal smear, with it superbly executed water coloured drawings of exfoliated cells and tissues[26]. Thus a diagnostic discipline has arisen in parallel with histopathology which subserves both screening and a predictive function. Unfortunately in many instances, these two streams in pathology developed as essentially separate disciplines so that the interchange of new ideas to the benefit of both did not occur as readily as it should have.

At about the same time histopathologists and cytologists began their tentative initiatives, Leyden and 3 years later, Menetrier[18] employed needles to obtain cells and tissue fragments, the former to isolate pneumonic micro - organisms and the latter to diagnose pulmonary carcinoma. Few early pathologists were, however, involved in this pioneering work and the development of needle aspiration cytology along with exfoliative cytology was, to a large extent, performed by `professional hybrids', clinicans who used these simple techniques as aids to rapid diagnosis. For example, the wide acceptance of needling the bone marrow as an integral part of the investigation of haematological problems continued

to serve as a reminder that almost every tissue could be sampled by an easily acquired technique requiring no anaesthesia nor the expensive intervention of surgeons. In the UK in 1927, Dugeon and Patrick[18] proposed the needling of tumours as a means of rapid microscopic of diagnosis; similarly, Martin and Ellis[18] at the Memorial Hospital in the USA were also advocates of needle aspiration, although the pathologists working with them initially insisted on sectioning as well as smearing the samples and would only make a confident diagnosis if cell-block preparations were obtained. Consequently, Martin and Ellis used needles of a thicker calibre (18 gauge) than those commonly in use today. The pathologists at Memorial hospital continued to use the technique, but this hospital remained an oasis for `aspiration biopsy' in the USA; limited interest was shown by other cancer centres.

It was in Europe, and particularly Scandinavia, that `fine needle aspiration cytology' (FNAC), as the technique was usually called, began to flourish in the 1950s and 1960s. Soderstrom and Franzen in Sweden and also Lopes Cardozo in Holland (all clinician / haematologists by training) became major proponents, studying thousands of cases each year. Zajicek[27,28], among the first of pathologists to embrance FNAC in collaboration with Franzen at the Karolinska Hospital, applied the requisite scientific rigor to define precise diagnostic criteria and to determine diagnostic accuracy in a variety of conditions. Disciples of these pioneers have spread the gospel to Europe, the Americas, Japan and Australia and the technique is now part of the service of all sophisticated departments of pathology.

It is interesting to note that more recently there has been a swing back to core

needles, usually of a lesser calibre than those used in the pre-FNAC era, and to histological sectioning of tissue fragments. This may be the result of the increasing pressure on tissue pathologists, including those without sufficient training and experience in diagnostic diagnoses on needle biopsy material in all kinds of disease processes in all sites.

We feel that core needle biopsy is an extremely valuable supplementary tool in selected cases, but that FNAC remains the first choice for the initial investigation and diagnosis of both superficial and deep lesions. Every effort should be made to improve the sampling and preparation techniques, to define diagnostic criteria and to identify possible causes of diagnostic error of FNAC in all sites.

FNAC, from being a technique mastered only by specialists cytopathologists, has become an expected part of the skills of all anatomical pathologists.

Although the use of FNAC has widened, there are pressures for specialisation in this discipline, as there are in other areas of anatomical pathology, and a balance between focused expertise and the availability of the test must be achieved. A certain minimum ongoing experience is necessary and this will become further defined. Clinicians, in particular surgeons, will become more aware of the advantages of concentration of sampling expertise with cytopathologists who work in a clinic setting offering rapid diagnosis.

These developments will ensure a dynamic and challenging discipline and one which continues to occupy a unique place straddling clinical and tissue diagnosis.

# MATERIALS AND METHODS

A total number of 2450 cases from "Head and Neck" region were aspirated and studied. The study period inclusive of two years from May 2004 to April 2006. The cases were from Kilpauk Medical College Government Hospital (from various units of surgery, medicine, surgical and medical gastro enterology departments and government thoracic medicine hospital Tambaram. The cases taken up for study is pertaining to "Head and Neck" region which comprises of lesions of Thyroid gland salivary gland, lymph nodes, and soft tissue. The age of the patients were from 2 years to 70 years. The lesions were clinically defined before aspiration and radiological assistance was obtained wherever necessary.

## PREPARATION FOR BIOPSY

Simple, local aseptic precautions were followed. No anesthesia was required.

## EQUIPMENT

1. Standard disposable needles 21 - 22 gauge (1.5" or 2") were used. Thicker needles caused more bleeding and were more frequently blocked by a plug of tissue.

2. Standard disposable 5ml syringes were used, to provide a good sustained negative pressure. Larger syringes and the use of a syringe holder, though recommended, were not used for fear of distortion of aspirated material due to

increased negative pressure.

3. Glass slides (15 * 25mm), thoroughly cleaned and free of grease were used. Aspirates were smeared between two standard slides or with a 4mm cover slip. For thyroid aspirates, vertical separation of slides produced smears (compression smears) where cell sheets and fragments are preserved in a more cohesive pattern for analysis. The conventional cell spread was more useful in other lesions, especially aspirates from lymph nodes where preservation of cell details is required. Air - dried smears where made thin while smears fixed with alcohol, thick.

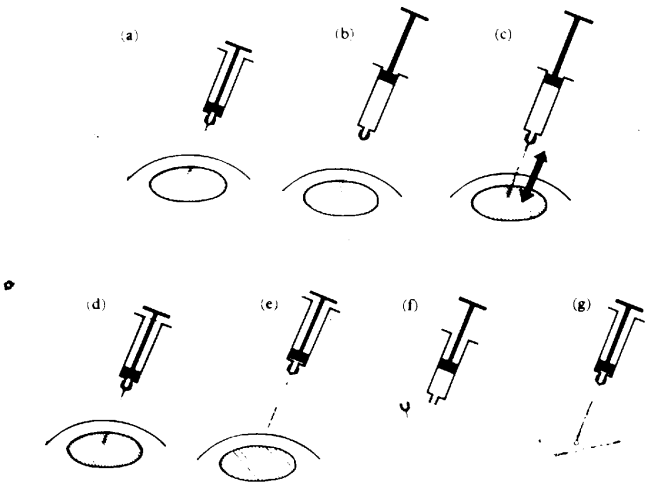
4. Fixatives - for wet - fixation, 70% to 90% ethanol in Coplin jars or spray fixatives were used. Aspirated material was better preserved with spray fixatives.

**PROCEDURE**

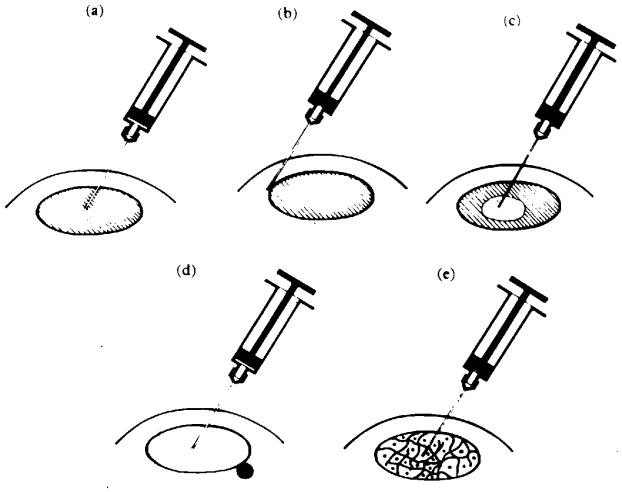
When aspirating superficial lesions, better control of the needle is achieved by supporting the barrel of the syringe by the free hand. Nearer vertical approaches tend to be less painful and allow better appreciation of depth. with practice and experience, one will eventually develop a fingertip sensitivity projected to the point of the needle, which in most cases, allows accurate positioning without technical aids.

The function of the negative pressure is not to tear cells from the tissue, but to merely hold the tissue against the sharp cutting edge of the needle. The softer tissue components are cut or scraped off and drawn into the lumen of the needle as it advances through the

tissue. Aggregates of tumour cells, glandular and other epithelial structures are more friable and softer than the supporting stroma and are therefore more easily sampled. The needle is then moved back and forth within the lesion with the negative pressure maintained. Entry of material into the syringe is avoided except when evacuating a cyst. The ideal aspirate has a high cell content in a small amount of fluid, a creamy consistency, and remains with in the lumen of the needle.




**Biopsy procedure**
Diagrammatic stepwise illustration of biopsy procedure: (a) needle positioned within target tissue, (b) plunger pulled to apply negative pressure, (c) needle moved back and forth within target tissue, (d) negative pressure released while needle remains in target tissue, (e) needle withdrawn, (f) needle detached, air drawn into syringe, (g) aspirate blown onto slide.




**Causes of unsatisfactory yield**
(a) Needle well-positioned within target tissue should produce satisfactory yield, (b) needle has missed the lesion tangentially, (c) central cystic, necrotic or haemorrhagic area devoid of diagnostic cells, (d) small malignant lesion adjacent to dominant benign mass, (e) fibrosclerotic target tissue poor in cells.

The negative pressure is released before the needle is withdrawn, as otherwise, the aspirate will be drawn into the syringe and the sample contaminated by material drawn while withdrawing the needle. Following aspiration, pressure is applied over the aspirated site to minimise bleeding.

Failure to obtain a representative sample is seen when

a) The needle passes the tumour tangentially and only the adjacent tissue is sampled;

b) The needle strikes areas of central necrosis, hemorrhage or cystic change; cystic lesions are therefore re-biopsied;

c) A small malignant disease is masked by a dominant benign tumour;

d) The tumour is desmoplastic.

**PREPARING THE ASPIRATE**

a) Direct smearing (1) Dry aspirates (numerous cells with a small amount of tissue fluid) are smeared with a cover-slip or another slide, exerting a light pressure to achieve a reasonably even, thin spread. Too firm smearing may produce crush artifacts. (2) Wet aspirates (smaller number of cells suspended in fluid or blood) are smeared by moving the cover - slip / slide to the middle of the slide while holding it at a blunt angle - this leaves most of the fluid behind while the cells follow the cover-slip like a buffy coat, which is then smeared as mentioned earlier. Good cell preservation depends on rapid drying, artifacts appear with slow drying.

b) Indirect smearing - Cell suspensions are made in 95% ethanol or 10% formalin if the aspirate is not more than a few drops. Needles and syringes are also rinsed with the fixative. The suspension is gently spun on the cytocentrifuge at 300Rpm for five minutes. Bloody aspirates are added to formalin to produce a

clot which is then processed as for routine histology.

**STAINING**

In air - dried smears, both the cytoplasm and the nucleus of the cell are flattened on the glass surface and appear larger than a cell fixed in ethanol. This is a helpful phenomenon in cytological diagnosis. Wet fixed smears are, however, comparable to tissue sections as far as cellular details are concerned.

**STAINING METHODS USED**

The routine staining procedures used were

1. Haematoxylin and Eosin
2. Papanicolaou's stain
3. Giemsa
4. Leishman
5. Special stains where required wherever available.

The results were compared with the subsequent histopathology sections of corresponding biopsy / surgical specimens.

## OBSERVATION

This present study comprises of 2450 cases from Head and Neck region. the age distribution was 2 - 70 years and the mean age was 38 years. The non neoplastic lesions

were (84.04%) more common than the neoplastic lesions (10.93%). Of all non neoplastic lesions, inflammatory conditions were the commonest followed by goitre and cystic lesions in decreasing order. Advised biopsy in inconclusive cases were 5.03%.

The data collection and distribution of cases which were aspirated from the Head and Neck region in this study has been given in the following table.

**TABLE - 1**

**DISTRIBUTION OF CASES OF FINE NEEDLE ASPIRATION**

| Year | Total | Thyroid | Lymphnode | Salivary gland | Soft tissue lesions |
|---|---|---|---|---|---|
| 2004 May to 2005 April | 1234 | 413 | 758 | 43 | 20 |
| 2005 May to 2006 April | 1216 | 297 | 842 | 47 | 30 |

## THYROID

The study comprised of 710 cases of thyroid lesions for a period of two years from May 2004 who have reported to our FNAC clinic. Age, Sex, duration of swelling, detailed clinical examination, features of hyper and hypothyrodism were recorded, where ever necessary thyroid function tests were used as a diagnostic tracer. Correlation of iodine uptake study was advised in doubtful cases to rule out follicular neoplasm.

## TABLE - 2

## AGE & SEX DISTRIBUTION

| Age Group | Male | Female | Total | Percentage |
|---|---|---|---|---|
| 11 - 20 yrs | 8 | 78 | 86 | 12.1% |
| 21 - 30 yrs | 15 | 110 | 125 | 17.6% |
| 31 - 40 yrs | 48 | 302 | 350 | 49.4% |
| 41 - 50 yrs | 36 | 50 | 86 | 12.1% |
| 51 - 60 yrs | 25 | 30 | 53 | 7.4% |
| Total | 132 | 578 | 710 | 100% |

**TABLE - 3**

**CATEGORISATION OF CYTOLOGICAL DIAGNOSIS**

| Cytological Diagnosis | Male | Female | Total | Percentage |
|---|---|---|---|---|
| Colloid Adenomatous goitre | 105 | 315 | 420 | 59.2% |
| Thyroditis - | | | | |
| Hashimoto's | 0 | 98 | 98 | 13.8% |
| Lymphocytic | 0 | 18 | 18 | 2.5% |
| Follicular neoplasm | 15 | 25 | 40 | 5.6% |
| Papillary carcinoma | 3 | 21 | 24 | 3.3% |
| Medullary carcinoma | 0 | 2 | 2 | 0.28% |
| Anaplastic carcinoma | 2 | 0 | 2 | 0.28% |
| Thyroglossal cyst | 2 | 6 | 8 | 1.12% |
| Advised Biopsy | 30 | 48 | 98 | 13.8% |

Fine needle aspiration was done for the above cases and studied. The cytological findings were categorised as follows.

1. Neoplasm - Benign - Follicular adenoma
   Malignant - Papillary carcinoma

   Medullary carcinoma anaplastic Ca

2. Non neoplastic lesions - Goitre,

   Thyroiditis Hashimoto's
   Lymphocytic

   Thyroglossal Cyst.

3. Advised biopsy Inconclusive

**OBSERVATIONS**

1. The mean age of the patients who were presented in this study was 30 - 40 yrs Males were 18.5% Females 81.5% as Shown in Table 2.

2. Presentation wise all cases had local swelling.

3. Features of hypothyroidism were seen in 60% of cases.

   Features of hyperthyroidism were found in 10% of cases.

   Features of euthyroid state were found in 30% of cases.

4. The categorization of FNAC diagnosis are given in Table 3. Maximum number of cases were colloid goitre - 59.2% in which 12.5% of cases appeared with papillary hyperplasia.

5. Some cases of Hashimoto's thyroiditis had solitary nodule and most of them were diffuse pattern predominantly.

6. Incidence of Papillary carcinoma was found to be high in middle age females in this study 21 / 24, M : F ratio was 1:3.

7. Occult primary of papillary carcinoma was seen in four cases with nodal metastasis.

8. One case of papillary carcinomatous deposit in rib with occult primary is included in our study.

9. Occurrence of dual pathology was seen in this study. One case was Hashimoto's thyroiditis with a focus of papillary carcinoma and one case was medullary carcinoma with papillary carcinoma.

10. Two cases of anaplastic thyroid carcinoma were seen in middle age of males.

Surgery was contemplated wherever aspirates had diagnosis of[20] :

1. Malignancy
2. Follicular adenomas
3. Cases having cosmetically unacceptable goitre
4. Sudden development of pressure symptoms.
5. Those not responding to thyroid suppressive therapy.

Rest of the cases were managed medically. The resected tissues were examined histologically findings were correlated with the corresponding FNAC results.

**TABLE - 4**

**HISTOPATHOLOGY CORRELATION WITH CYTOLOGY DIAGNOSIS**

| Sl.No. | Cytological diagnosis | Number of Cases | Positive histopathology Correlation | Diagnostic accuracy % |
|---|---|---|---|---|
| 1. | Goitre | 55 | 53 | 96.6% |
| 2. | Thyroiditis | 5 | 5 | 100% |
| 3. | Thyrogrosal cyst | 8 | 8 | |
| 4. | Follicular adenoma | 33 | 30 | 91.4% |
| 5. | Malignancy | 12 | 15 | 80% |

**TABLE - 5**

**NON - NEOPLASTIC LESIONS - CYTOLOGICAL**

**ACCURACY 96.6%**

| | Cytological diagnosis | Number of cases | Consistent | Inconsistent | Hp Diagnosis |
|---|---|---|---|---|---|
| 1. | Simple Colloid goitre | 5 | 5 | - | - |
| 2. | Nodular goitre | 50 | 48 | 2 | Follicular adenoma |
| 3. | Hashimoto's thyroiditis | 5 | 5 | - | - |
| 4. | Thyroglossal cyst | 8 | 8 | - | - |

The distribution of various non neoplastic lesions are shown in Table 5. The cytologic accuracy is 96.06%. Two cases of nodular goiter with epithelial hyperplasia showed in histopathology features of follicular adenoma. The epithelial hyperplasia and the amount of colloid present in these cases misguided us. This sampling error could have been minimised if reaspirated.

**TABLE - 6**

**NEOPLASTIC LESIONS - CYTOLOGIC ACCURACY**

| | Cyto diagnosis | Number of cases | Consistent | Inconsistent | Hp Diagnosis |
|---|---|---|---|---|---|
| 1. | Follicular adenoma | 35 | 32 | 3 | 1 Papillary carcinoma<br><br>2 Nodular goitre with papillary hyperplasia |
| 2. | Papillary carcinoma | 10 | 13 | 3 | 1 Hashimoto's thyroiditis with papillary carcinoma<br><br>2 Medullary carcinoma with papillary carcinoma |
| 3. | Medullary carcinoma | 2 | 2 | - | - |

The distribution of neoplasms in this study is shown in Table 6. In this series among 35 patients diagnosed by cytology to have follicular adenoma, three cases were deferred in histopathology correlation. One case was diagnosed as follicular adenoma with focal papillary carcinoma in histology. This sampling error is because the focal papillary carcinoma area was not struck during aspiration. Two cases were diagnosed as nodular goitre with papillary hyperplasia. However in malignancy, two cases of papillary carcinoma were missed in dual pathology.

There was no false positive diagnosis of malignancy in this series. If the false positive rate approaches to zero the cytological report can be used as a basis for definitive surgery. One case of follicular adenoma showed features of follicular carcinoma in histopathology. FNAC has little to offer over FNAC in the assessment of follicular neoplasm as these require extensive sampling to prove capsular or vascular invasion. It is difficult to diagnose follicular carcinoma in FNAC without evidence of capsular and vascular invasion.

## THYROID LESIONS AND THEIR CYTOLOGICAL FINDINGS

In normal thyroid, the follicles are seldom removed intact. The cells may be distributed in sheets or loose clusters. They are fragile and tend to disrupt easily so that bare nuclei are common. Nuclei are round to oval with regular nuclear outlines. Small nucleoli may be seen. Cytoplasm stains pink with H&E and pale blue with MGG. The cell borders are indistinct and feathery. Colloid stains blue to purple with MGG and pink with H&E.

### Simple colloid goitre :

"Normal cytological appearance" of the aspirate associated with a diffusely enlarged gland.

### Nodular colloid goitre

1. Abundant colloid is the most characteristic finding both thick and thin types.

2. The follicular epithelial cells are distributed in sheets, clumps and acinar

formation, with feathery cytoplasm. Numerous bare nuclei are seen. Anisonucleosis and Askanazy cells or oncocytic change may also occur.

3. Foamy cells indicating degenerative changes may contain haemosiderin, resulting from broken down eyrthyrocytes, if phagocytic. They are probably follicular epithelium derived though it is difficult to differentiate them from cells of monocytic origin.

4. Degenerating eyrthrocytes.

5. Hyalinised stroma.

**Follicular Neoplasm**

1. The smear is quite cellular.

2. Many microfollicular cell clusters are scattered throughout the smear. Cell clusters in more solid neoplasms are usually more variable in size.

3. The colloid is scanty.

4. Askanazy and clear cell changes are variably seen. Distinction between goitrous lesions and follicular neoplasms is perhaps the most common differential diagnostic problem in a solitary nodule. Abundant amounts of colloid with large follicles is more in favour of a goitrous enlargement.

Follicular neoplasms are often vascular and the aspirate therefore bloodstained. Caution in making a cytological diagnosis of malignancy, particularly in follicular lesions, is warranted, as some atypical adenomas may be composed of pleomorphic cells suggestive

of malignancy but histological evidence of vascular or capsular invasion alone can confirm malignancy.

**Hashimoto's Thyroiditis**

The main features in the aspirate are:

1. Askanazy cells - the thyroid epithelial cells are converted to a non - functioning form with abundant eosinophilic cytoplasm. Their nuclei are larger than normal and variable in size.

2. Moderate numbers of lymphocytes mainly of the small mature type, and scattered plasma cells.

3. Small multinucleate giant cells are seen. Epithelioid cells are present occasionally and their significance is uncertain.

Two basic patterns are recognised in cytological specimens - the classical pattern with askanazy cells and plump epithelioid like cells occurs in older patients who are more often hypothyroid.

The florid lymphocyte pattern occurs in younger patients or in those with disease of shorter duration and they are usually euthyroid.

**PROBLEMS IN DIAGNOSIS**

1. Distinguishing bare thyroid nuclei from lymphocytes - A thin rim of cytoplasm is characteristic of lymphocytes while single thyroid cells are almost always stripped nuclei. Thyroid nuclei are fairly uniform with

homogeneous chromatin.

2. Lymphocytic infiltration may coexist with neoplasia particularly papillary carcinoma, and in Grave's disease. Predominant lymphocyte aspirates should be distinguished from lymphomas especially follicular lymphomas.

3. Askanazy cells - In burnt out Hashimotos or those with focal nodular hyperplasias, the aspirate may be predominantly of Askanazy cells. In hashimoto's thyroiditis anisonucleosis is present but hurthle cell adenoma show uniform nucleus. Distinction from Askanazy cell neoplasia may then be possible only with surgically excised specimens.

**PAPILLARY CARCINOMA**

Smears are characterised by

1. Increased cellularity with papillary clusters ; sometimes the cells form monolayered sheets with papillaroid outlines with distinct anatomical edges. Cellular pleomorphism is seen, the cytoplasm dense with distinct cell borders. Cells with oncocytic change are also seen.

2. Intranuclear cytoplasmic inclusions which are regarded as pathognomonic of papillary carcinoma are seen in 90% of lesions and in upto 5% of cells. The inclusions are similar in colour and texture to the cytoplasm, sometimes paler. They probably represent cytoplasm entrapped within deep nuclear folds.

These changes are occasionally seen in anaplastic, medullary and follicular neoplasms and also in certain non - neoplastic conditions where the other cytological features prevent misdiagnosis.

3. Scanty "Chewing gum" like colloid.

4. Psammoma bodies in a small percentage of lesions only.

5. Macrophages and cell debris representing cystic changes.

**MEDULLARY CARCINOMA**

Aspirates show a dispersed cell pattern, both in the classical and spindle cell varieties. Nuclei are usually eccentrically placed within the cells of the more plasmacytoid type. The cytoplasm is moderately dense with well defined borders. Spindle cells have a more centrally placed nucleus with less distinct cytoplasm. Cytoplasmic granularity is usually fine and may not be present in all cells. The granules have immunologically shown to be calcitonin. Amyloid appears as amorphous pink material. It is sometimes intracellular.

**PROBLEMS IN DIAGNOSIS**

1. Variants such as small cell, giant cell or poorly differentiated spindle cell forms may resemble other spindle cell tumours, eg., fibroblastic tumours and melanomas, cytologically. Immunoperoxidase or immunofluorescent identification of tumour cells are valuable in confirming the diagnosis.

2. Cells of follicular carcinoma are usually arranged in clusters as against the

dissociated distribution of medullary carcinoma. But the reverse may be seen in either malignancies.

## LYMPHNODE

The distribution of the cytologic diagnosis of lymphnode of Head and Neck region is shown in the table 7.

**TABLE - 7**

**CYTOLOGICAL CATEGORISATION OF LYMPHNODE LESIONS**

| Period | Reactive | Tuberculous adenitis | Non specific | Metastatic | Lympho proliferative disorders | Suppurative | Bx. Sugg. |
|---|---|---|---|---|---|---|---|
| May'04 to Apr' 05 | 105 | 510 | 65 | 60 | 5 | 8 | 5 |
| May'05 to Apr'06 | 155 | 528 | 54 | 54 | 6 | 25 | 20 |

## OBSERVATION

Aspiration cytology done on 1600 cases of lymphnode were interpreted and tabulated. The age of these patients ranged from 2 years to 70 years. Table 8 demonstrates distribution of the patients according to the site of aspiration.

**TABLE - 8**

**CATEGORISATION OF SITES OF LESIONS**

| Site of aspiration | No. of cases | Percentage |
|---|---|---|
| Cervical nodes | 1175 | 83.12% |
| Submandibular node | 295 | 18.4% |
| Posterior auricular nodes | 98 | 6.12% |
| Submental nodes | 32 | 2% |

**TABLE - 9**

**HISTOPATHOLOGY CORRELATION WITH**

**CYTOLOGICAL DIAGNOSIS**

| Cytological diagnosis | No. of Cases | Consistent | Inconsistent |
|---|---|---|---|
| Tuberculous lymphadenitis | 23 | 23 | 100% |
| Metastatic deposit in lymphnode | 7 | 7 | 100% |
| Lymphoma | 5 | 5 | 100% |

* Out of 1600 cases 265 cases were diagnosed as reactive nodes by their cytologic appearance. These cases were advised to rule out focal sepsis and a course of antibiotics and a repeat aspirate at a later date.

* 1038 cases were diagnosed as tuberculous lymphadentis. This is inclusive of persistent swelling even after a course of anti tuberculous treatment may be due to drug resistent in this study (10%).

* There were 11 cases of lymphoproliferative disorders.

* Metastatic deposits found in 104 cases. Out of these squamous cell carcinomatous deposits were 50% and adenocarcinomatous deposits were 35% and 15% were poorly differentiated carcinoma.

* Probable primary was suggested from smears to the clinicians and cases were diagnosed retrospectively by CT scan, endoscopic biopsies, and direct and indirect laryngoscopic biopsies.

* There were four aspirates of metastatic papillary carcinoma of thyroid with occult primary.

* Aspirates from Human Immuno Defficiency patients from Tambaram Government Hospital showed paucity of lymphocytes, with extensive necrosis, and occasional epithelioid granulomas.

**PROBLEMS IN DIAGNOSIS OF REACTIVE LYMPHADENITIS**

In follicular hyperplasia with large germinal centers, the aspirate may show a greater proportion of blast forms with more mitoses, tempting a diagnosis of malignant lymphoma. However, in lymphoma a monomorphic cellular pattern is seen.

The reactive node shows a mixed population of lymphoid cells with a predominance of normal small lymphocytes. Also seen are scattered histiocytes with intracytoplasmic nuclear debris, tingible body macrophages, with variable numbers of plasma cells, endothelial cells and neutrophils[23].

Histiocytes may be prominent in reactive adentitis especially within a few days of lymphangiographic examination. They have abundant pale or eosinophilic cytoplasm which may be vacuolated or granular and contain phagocytosed debris.

In viral lymphadenitis, paticularly mononucleosis, immunoblasts and atypical lymphocytes can be numerous. The atypical lymphocytes have an abundant basophilic cytoplasm, an enlarged eccentric nucleus and a paler nuclear chromatin. Binucleate immunoblasts resembling Reed - Sternberg cells can cause differential diagnostic problems. A similar picture can be seen in post vaccinial lymphadenitis and dilantin hypersensitivity lymphadenopathy with prominent immunoblasts.

**GRANULOMATOUS LYMPHADENITIS**

Epithelioid cells have elongated nuclei, resembling a footprint or the sole of a slipper. The nuclear chromatin is finely granular and pale, and the cytoplasm pale and indistinct. Multinucleated Langhan's giant cells are usually sparse. Caseous material appears granular and eosinophilic. Absence of necrosis probably suggests sarcoidosis. If neutrophils are conspicuous, the possibility of cat - scratch disease should be thought of. Special stains for AFB were employed on suspicious smears but we could not demonstrate AFB in any of our smears - Dead and degenerative bacilli may not be positive for AFB.

**PROBLEMS IN DIAGNOSIS**

Tumour Necrosis - Predominant necrotic material in the aspirate might pose a problem in distinguishing caseous material from tumour necrosis. Demonstration of AFB will be useful in distinguishing them.

Endothelial cells can at times resemble epithelioid hitiocytes, eg., deposits from Kaposi's sarcoma can be mistaken for granulomatous lymphadenitis, when a careful history and appropriate special stains will help.

Epithelioid granulomata are sometimes found in cases of malignant lymphoma and in regional lymph nodes draining carcinoma. Careful search for the same should be made in all the smears.

**METASTATIC MALIGNANCY**

Smears contain "foreign cells" amongst normal lymphoid cells with cytological criteria for malignancy.

Micrometastasis may be missed while sampling. Benign epithelial inclusions, though rare are sometimes seen as inclusions of salivary gland or thyroid in cervical lymph node. These cells will not have malignant characteristics.

Squamous cell carcinomas are particularly prone to undergo liquefactive necrosis. The aspirates then contain few well - preserved neoplastic squamous epithelial cells which may be very well differentiated. This could be mistaken for a branchial cyst.

**NON - HODGKIN'S LYMPHOMA**

The smear pattern is monomorphic and reflects the cell type - well differentiated or poorly differentiated, cleaved or non -cleaved. However, it is difficult to differentiate between the nodular and diffuse patterns with FNA smears, for which histology is essential.

The presence of small cytoplasmic fragments, termed "lymphoglandular bodies", can be a useful means of determining the lymphoid nature of a lesion. These cytoplasmic fragments are an artefact of smearing and reflect the fragility of lymphoid cells, in contrast to the more durable nature of epithelial cell cytoplasm. Surface marker studies help in specific cell classification.

The diagnostic accuracy for malignant lymphoma is much less than that of metastatic lesions 50 to 60%. Further cytological sub typing of non hodgkin lymphoma from FNA smears baffles even the experienced cytologist.

## SALIVARY GLANDS

This study comprises of 90 cases of salivary gland lesions. Detailed clinical history comprising, duration of the swelling, pain related with mastication, sudden increase in size, recurrence, prior surgery, previous radiation therapy. 45 cases had histology correlation available. 45 cases were treated medically for sial adenitis .

These cases were aspirated and studied. The various distribution of cases categorised as follows.

**TABLE - 10**

**CATEGORISATION OF CYTOLOGICAL DIAGNOSIS**

| Cytological Diagnosis | No. of Cases |
|---|---|

| | |
|---|---|
| Pleomorphic adenoma | 26 |
| Monomorphic adenoma | 3 |
| Sialadenitis | 45 |
| Warthin's tumour | 2 |
| Oncocytoma | 1 |
| Schwannoma | 1 |
| Retention cyst | 6 |
| Mucoepidermoid carcinoma | 5 |
| Tuberculosis | 1 |
| **Total** | **90** |

**DISTRIBUTION OF THE LESIONS AFFECTED GLANDS**

Parotid 80%

Submandibular 18%

Submental 2%

* Inconsistent cytological diagnosis (false negative) was given in one case, histopathology of which subsequently showed muco epidermoid carcinoma.

* The histopathology correlation was consistent with monomorphic adenoma in all the three cases.

* The most common benign lesion was sialadenitis and were treated medically.

* Foci of adenocarcinoma was found in one case of pleomophic adenoma after excision biopsy.

* Our study showed common occurrence of pleomorphic adenoma among the neoplasm affecting the parotid gland with female preponderence in the study.

* Two cases of warthin's, tumour in elderly individuals and one case of oncocytoma and one case of schwannoma proved consistent correlation with histopathology.

* Five cases with cystic areas conaining mucin diagnosed as mucoepidemoid carcinoma were histopathologically consistent. Cytology showed mucinous back ground and foamy cells with cytoplasm.

* There is no false positive diagnosis of malignancy in this series.

* One case diagnosed as tuberculosis of intraparotid node was proved to be lymphoma by biopsy.

## TABLE - 11

## HISTOPATHOLOGY CORRELATION WITH CYTOLOGIC DIAGNOSIS

| Cytological diagnosis | No. of Cases | Consistent | Inconsistent | Percentage |
|---|---|---|---|---|
| Pleomorphic adenoma | 26 | 25 | 1 carcinoma in pleomorphic adenoma | 96.1 |
| Monomorphic adenoma | 3 | 3 | - | 100% |
| Retention cyst | 6 | 5 | 1 MEC | 83% |
| Warthin's tumours | 2 | 2 | - | 100% |
| Oncocytoma | 1 | 1 | - | 100% |
| Schwannoma | 1 | 1 | - | 100% |
| Mucoepidemoid carcinoma | 5 | 5 | - | 100% |
| Tuberculosis | 1 | - | 1 lymphoma | - |

## SOFT TISSUE LESIONS

A total number of 50 cases were aspirated. The categorisation of cases were given in Table 12.

**TABLE - 12**

**CATEGORISATION OF CYTOLOGIC DIAGNOSIS**

| Cytological diagnosis | No. of Cases |
|---|---|
| Lipoma | 34 |
| Neural lesions | 3 |
| Lymph cyst | 2 |
| Branchial cyst | 6 |
| Epidermal cyst | 5 |

Total number of 34 cases were given a diagnosis of lipoma. Two cases were sent by clinicians as lymphadenopathy revealed mature adipose tissue in aspiration.

Incidence of branchial cyst was found in six aspirations few were mistaken for thyroid lesions by clinicians.

Two cases of lymph cyst were diagnosed in our study. These two cases were proved consistent with histopathology.

Five aspirations showed features of epidermal cyst.

**TABLE - 13**

**HISTOPATHOLOGY CORRELATION WITH CYTOLOGIC DIAGNOSIS**

| Cytological diagnosis | No. of cases | Consistent | Inconsistent | Percentage |
|---|---|---|---|---|
| Lipoma | 28 | 28 | 2 | 100% |
| Neural | 3 | 3 | - | 100% |
| Lymph cyst | 2 | 2 | - | 100% |
| Branchial cyst | 6 | 6 | - | 100% |
| Epidermal cyst | 5 | 5 | - | 100% |

# DISCUSSION

The diagnostic value of fine needle aspiration has been gaining recognistion and its advantages and limitations are realised. It is the pattern recognitition that dominates for successful diagnosis by the aspiration cytology smear method. The aspiration methodology that produces a good quality microscopic image, should therefore be adhered to. Reliability of diagnosis by aspiration smear must also be judged by a suitable and reproducible standard.

The current focus of aspiration cytology is on two areas - methodology and reliability. The fundamental principle is to obtain an aspirate sample and produce a stained image on a microscopic slide, that is a true reflection of the disease process in the patient. For this reason, aspiration cytology is most useful in tumour diagnosis.

To increase the accuracy the Sinai Hospital team, Detroit, established a criterion for adequacy of FNAC specimens - atleast six - clusters of cells in each of two slides prepared from seperate aspiration. This standardisation followed a reterospective analysis of false negative diagnosis made in 1000 cases. Geographical sampling "miss" can be overcome by repeat FNA.

There has been a debate over the best staining method between proponents of Romanawsky stain on air dried smears and proponents of Papanicolau's stain on wet fixed smears and haemotoxylin and eosin, on either fixed or dried smears. Cytoplasmic details are better outlined with giemsa staining while pap's staining high lights the nuclear details. The

granularity of oncocytes and other types of granular cells, cytoplasmic features of some endocrine cells, and the Keratinisation of the well differentiated squamous cells are well depicted with H&E stain[17] kline at all are advocates of H&E. Staining in both air-dried and alcohol fixed smears[14]. In our study it was easier to interpret with haematoxylin and eosin stained smears.

The real mastery of aspiration biopsy cytology, is the ability to translate cytologic patterns in to tissue patterns that have diagnostic meaning. The reliance on individual cell features to the exclusion of pattern, is perhaps the most important deterrant to an understanding of aspiration cytology.

The utility of FNA specimen can be enhanced by cell block preparation. Light microscopy and electron microscopy examination of these prepartions have the following advantages 1. It gives a well preserved cellular mophology. 2. The tissue structure and growth pattern is preserved which is important for diagnosis. 3. Conventional histology stains can be applied, giving additional information and 4. Specimens can be saved in blocks.

Ultimately it is the team work among pathologist, clinicians and radiologists who participate in FNA, that will yield the best results. The five precepts to be observed in a standarized fastion in order to maximise the value of FNA diagnosis are :

**1. Clinical data**

History and physical examination, laboratory results previous maternal, clinical

impression.

**2. Site and sample verification**

Knowledge of terrain, location of needle, radiological appearance, collection and fixation, guided FNAC is now gaining importance.

**3. Cell populations**

Rich Vs poorly cellular, single Vs mixed, alien vs native, normal vs abnormal.

**4. Cytomonphological data**

Character of background, group Vs isolated cells, individual cell morphiology, criteria for malignancy.

5. **Multimodal approach**

Electron microscopy, immunocytochemistry, flow cytometry and image analysis.

## SPECIFIC APPLICATION

**One of the organs where FNB has had wide application is the THYROID**

The solitary nodule of thyroid is a common clinical problem where cytology can be of immense help[11]. In the hands of an experienced pathologist definite typing of a neoplasm is possible, permitting a one stage surgical procedure without prior diagnostic surgical biopsy[28]. Cases of inconclusive results, on reaspiration may lead to a definitive diagnosis. "In this study repeat aspiration was done for few cases to improve the sensitivity of the technique of FNB.

Surgery was avoided in the following cases[11,26] who were diagnosed as follows in our study :

1. Resolution of a cystic nodule after aspiration
2. Non toxic goite
3. A high operative risk without suspicious cytology
4. Response to suppression therapy

5. Thyroiditis

6. Small functioning or non functioning nodules.

Frable interpreted 20 cases as follicular adenoma where as 3 were actually collid goitre, Kini colleagues interpreted 79 as follicular adenoma whereas 14 were actually colloid goitre. In our study 2 cases of follicular adenoma were reported as colloid goitre and 2 cases of nodular goitre were reported as follicular adenoma[6]. However over lapping epithelial hyperplasia and neoplasia is unavoidable. This sampling error could have been over come by repeat aspiration. One case of follicular adenoma in our study revealed features of papillary carcinoma in histopathology. Confusion between follicular adenoma and papillary carcinoma is unavoidable especially in follicular variant of papillary carcinoma[6].

Aspiration cytology is not very effective in predicting neoplasia in cystic thyroid swellings. We had difficulty in aspirating the cystic swelling where we could get only cystic fluid. On repeat aspiration, especially in papillary carcinoma the centrifuged material may be able to arrive at a diagnosis or may be advised for biopsy for conformative diagnosis.

The sensitivity of FNA diagnosis in cystic neoplasms may be as low as 40% and all cystic lesions should be managed cautiously.

No false positive reports of malignancy is seen.

The cytologic accuracy with large degenerated nodules is lower, in that the ability to differentiate benign and malignant follicular neoplasm is limited. It is important not only to enhance the specificity of preoperative diagnosis but also to increase simultaneously the sensitivity of detection. So that patients with carcinoma are discovered early for effective therapy[5,19].

The transition of differenitated thyroid carcinoma to anaplastic thyroid cancers seems to be well established[25]. The incidence of anaplastic carcinoma in our present study is two cases in middle aged persons. About 20% to 30% of all giant cell anaplastic carcinomas have a long history of thyroid swelling more than 15 years. FNAC of all goitres may result in the detection of such unsuspected, differentiated thyroid cancers with a transition to anaplastic carcinoma. Thus one type of very serious thyroid neoplasm can be prevented by early detection highlighting the role of FNA as a screening procedure in the high risk group[25].

The incidence of dual pathology, was seen in 2 cases. One was Hashimoto's thyroiditis with papillary carcinoma. The other was medullary carcinoma with papillary carcinoma. In both these cases we arrived at only one diagnosis. In both these cases papillary carcinoma foci was not struck during aspiration. Chronic thyroditis can coexist with many type of thyroid cancers and we overlooked the neoplastic lesion in the above cases.

This sampling error could have been avoided if repeat aspiration was performed.

FNAC is fairly sensitive and specific test in detecting malignant thyroid lesions. We found papillary carcinoma was the commonest lesion in thyroid in this study.

The results of accuracy of FNAC vary but in most series overall accuracy rate exceed 90% with 5 - 10% frequency of false positive and false negative[14]. Diagnostic accuracy found in this study was 98.08%, and false positive 1.90% false negative rate 4.76%. False negative diagnosis arises from inadequate samples, geographic misses of lesions, dual pathology and errors of interpretations and also in relation to the cystic neoplasm. The present study confirms the view that FNAC has potential ability to detect both benign and malignant lesions with accuracy. Thus FNAC can be used as effective, safe diagnostic method for defining thyroid disorders it is used as screening test and helps in selection of patients for surgery[1,25] .

**LYMPHNODES**

The present study conducted on 1600 cases of lymphnode lesions showed age distribution of 2 years to 70 years. Most of the young aged patients revealed reactvie lymphadenities and tuberculous pathology. The incidence in old indiviudals was found to be metastatic carcinomatous deposit. It was difficult to perform FNAC in young children aged below 5 years.

The proliferation of different cell types in reactive lymphoadenopathy depends on many factors like the basic disease, patients age causative agent and stage of infection. In all instances a more or less mixed polymorphic cell pattern can be observed. Tingible body

macrophages accompanied by transformed lymphocytes of follicle centre origin are a distinct feature of prounced follicular hyperplasia[23]. The presence of tingible body macrophages alone does not exclude malignancy since they may be observed in centroblastic, centrocytic lymphomas, lymphoblastic lymphomas of the Burkit's type and in a reactive node partially infiltrated by malignant lymphoma[24].

The cell pattern is polymorphic with a preponderance of small normal lymphocytes in benign lesions and is monomorphic in non-Hodgkin's[23] lymphoma. The present study had eleven cases of lymphoma. Non Hodgkin's lymphoma comprised a higher percentage (70.5%) than Hodgkin's disease. (29.5%) Seperation of lymphomas from benign lymphadenopathies" is a present challenge. Differential diagnostic problems may arise between reactive adenitis and Non Hodgkin's lymphoma. Abundant mitosis although associated with lymphomas of high-grade malignancy have also a been described in condition like infectious. Mononucleosis. R.S. like cells have also been observed in Infectious Mononucleosis and tuberculosis[23,14].

Secondary carcinomatous deposits in lymphnodes were seen in 7.12% of the total cases in our study which is comparable to various other studies.

The diagnostic accuracy which was confirmed by histopathology was 80% which is in accordance with other studies. Squamous cell carcinomatous deposit metastatic to lymphnodes were most common followed by adenocarcinomatous deposis and poorly differenitated carcinomatous deposits.

Metastatic papillary carcinoma of thyroid was seen in four cases of cervical lymphnode. Primary site identification was not possible in 18.6% of metastatic lesions in other studies where as it is found to be 10% in this study. It may also be impossible to distinguish aspirates from anaplastic carcinomas and histocytic lymphoma. Insufficient maternal is most often due to failure to puncture a small deep node or due to nodal fibrosis or extensive necrosis.

In this study the cytologic accuracy of lymphonode is 100%. The use of fine needle aspiration offers many advantages. It can be used as an effective tool in the management of lymphadenopathy to differentiate inflammatory from neoplastic conditions. Simple reactive adenitis, granulomatous lymphadenits can be diagnosed by FNAC and managed medically. It is useful for typing of lymphomas and for the diagnosis in relapse of lymphomas and preliminary screen diagnostic test for metastatic disease is this study.

**SALIVARY GLAND LESIONS**

Any abnormal swelling in the region of salivary gland lesions especially superficial lesions can be subjected to FNAC[4]. In our study we aspirated 90 cases of salivary gland lesions in a period of two years. The incidence of site involvement was most common in parotid gland followed by submandibular gland. The age incidence was more in middle aged patients and females.

The most common lesions aspirated were sialadenitis cases which showed an inflammatory pathology[13]. We had problem in few cases with regenerating ductal epithelium which has undergone squamous metaplasia[9]. Multiple sampling and clinical

history evaluation helped us in these cases to arrive a good specificity

Among the neoplasms most common occurrence was pleomorphic adenoma. Out of 26 cases 25 cases were consistent with histopathology report. The one case revealed carcinoma in pleomorphic adenoma which can be confirmed only by biopsy Histological confirmation is necessary in these cases, false negativity could be minimised by reaspiration in doubtful case.

Thirty years ago Karloniska workers published a series of papers which documented to diagnostic accuracy of FNB in large series of cases of a number of salivary gland neoplasm[18]. They also demonstrated an increasing accuracy with increasing experience. A review of the more recent reported series presented in 1994 found that the diagnostic sensitivity varied between 81% - 100%. Specificity was 94 - 100% and the Accuracy of tumours typing was 61 - 80% our own results are in accordance with these figures. Positive Greater was 98.88% false negative rate 3.33% no false positive report.

Using the criteria developed by the Karloniska group, the diagnosis of pleomorphic adenoma and of warthin's tumour is easy in most cases[5,27,28]. We have diagnosed 2 cases of warthin's tumour in 2 elderly individuals, both cases showed consistent results with hispathology report. One case of oncocytoma proved positive correlation with histopathology. Oncocytes have a granular cytoplasm and oncocytomas have clean background.

False positive diagnosis can be caused by regenerative epithelial cells in sialadenitis

and warthin's tumours and epithelial atypia with high cellularity can occasionally be worrying in pleomorphic adenoma. Hyaline globules can be seen in monomorphic adenomas and adenoid cystic carcinoma[18]. The distinction between primary and metastatic cancer may be extremely difficult in poorly differentiated carcinoma.

We have not come across any complication during aspiration of salivary glands like infarction or tumour dissemination or implantation in a fine needle track damage to adjacent structures such as the facial nerve[18]. Information of salivary gland tumours post - FNAC has been reported in other studies, subsequent reactive changes and repair can cause difficulties in histological diagnosis[12].

There was one false negative report in a case of retention cyst proved to be low grade mucoepidermoid carcinoma. Multiple sampling had been done on different occasions in this case but yielded only cystic fluid which contained only inflammatory cells. One case of intraparotid lymphnode swelling diagnosed by aspiration as tuberculosis showed lymphoma in histopathology. Since lymphoma is not a common occurrence at this site it turned out to be false.

Salivary glands are generally not subjected to incisional or core needle biopsy because of the possible risks of fistula and tumour implantation. The salivary glands are eminently accessible to aspiration and material easily obtained Fine needle aspiration can be used as effective tool in the management of lesions of salivary glands to differentiate inflammatory from neoplastic conditions[9].

## SOFT TISSUE LESIONS

We have aspirated a total number of 51 cases of soft tissue lesions in the region of Head and Neck. The cases sent to us from clinicians were mostly benign lesions. Lipoma was the most common occurrence in our study was proved by histopathology with consistent reports. In few cases there was poor yield in which repeat aspirations were done to improve the specificity.

Cases of branchial cysts and epidermal cysts were consistent with histopathology. Few cases of branchial cysts which were referred as thyroid nodules by clinicians proved to be branchial cyst in FNAC and histopathology. Three cases of neural lesions proved consistent result with histopathology as schwannoma. In a series of FNA of 187 ST lesions by Akerman et al., 85% were diagnosed correctly as benign on malignant. The cytological accuracy of the present study in soft tissue lesions is 100%.

Head and Neck region being sensitive area and visible superficial soft tissue lesions can be easily diagnosed by FNAC with to delineate benign neoplasm from malignant ones and earlier treatment can be planned. The patient gets immediate information regarding the nature of the lesion and the clinician plans the mode of further treatment with FNAC reports.

# CONCLUSION

- FNAC is a simple procedure that can be done as an outpatient procedure.
- We had not encountered any complication during or following the procedure.
- FNAC can be done in all superficial lesions of lymphnodes, salivary glands, thyroid and soft tissue lesions.
- Diagnostic accuracy depends upon location, type of lesions and expertise of cytopathologist.
- In the above study the sensitivity of FNAC, was 96 - 100% in lesions of thyroid and salivary gland tumour.
- Accuracy is 100% in diagnosis of metastatic deposits in lymphnode.
- Tuberculous adenitis was a common lesion and early developing epithelioid granulomas could be appreciated.
- We had difficulty in aspirating children below 5 years and in small deep nodes.
- Most cases diagnosed as secondary carcinomatous deposit were diagnosed for primary by relevant diagnostic techniques.
- False negativity was minimal in this study. Reappraisal of slides could have minimised false negativity in this study.

- There was no false positive diagnosis of malignancy in our study.

The results of this study convincingly demonstrates the feasibility of making a definitive diagnosis, with limitations, by fine needle aspiration cytology in Head and Neck region.

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